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ABSTRACT

The term "contextual learning" refers to the type of learning that has also been called experiential learning, real-world education, active learning, and learner-centered instruction. Unlike traditional school learning, which is based on the principles of individual learning in a manner that is independent of tools and dependent on symbols, contextual learning is characterized by the following features: socially shared, thinking shaped by/engaged with tools, learning engaged with objects and events, and situation-specific learning. The practical benefits of contextual learning has been documented in case studies of contextual learning in school-based vocational education, the workplace, and the community, as well as in studies of contextual learning as "cognitive apprenticeship." Among the main contextual learning-related issues facing teachers are the following: rethinking the areas of curriculum, instruction, and assessment; providing students with hands-on experiences in which they can learn about and participate in the workplace, providing adequate staff development for teachers and employers involved in contextual learning programs, and reorganizing school periods and providing the administrative support required to plan and deliver contextual learning programs. (Ten best practices for contextual learning and 32 references are included.) (MN)

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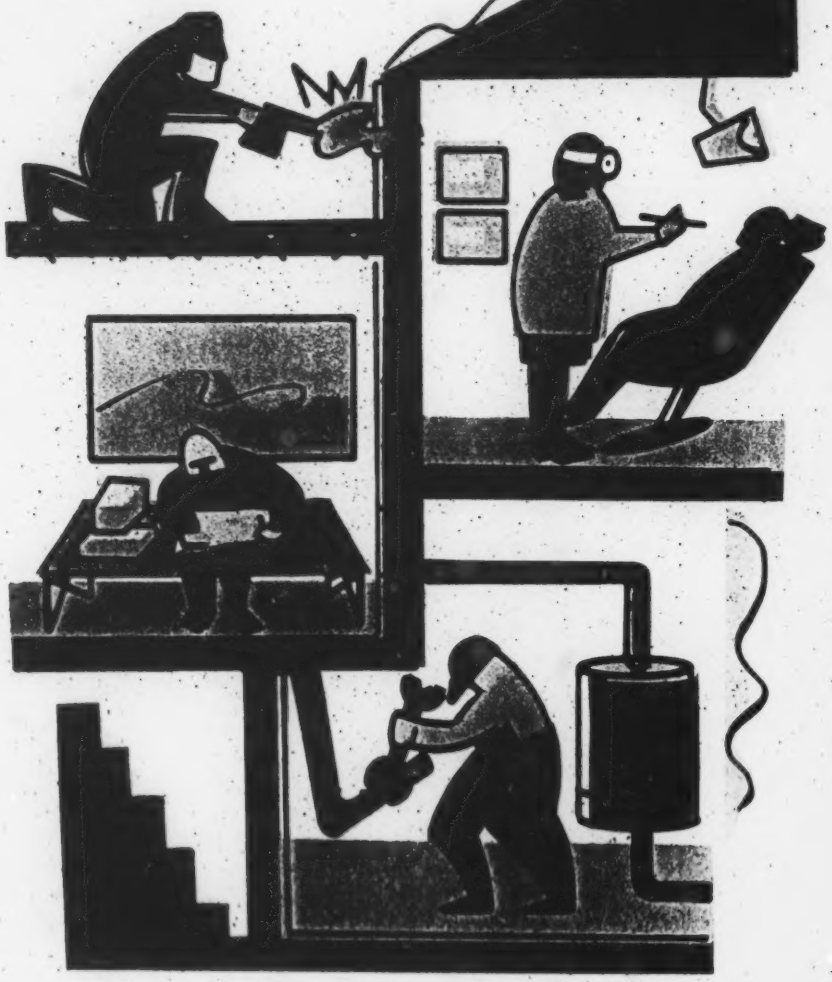
CONTEXTUAL LEARNING

A CRITICAL ASPECT OF SCHOOL TO WORK TRANSITION PROGRAMS



National Institute for Work and Learning

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Contextual Learning:

A Critical Aspect of School-to-Work Transition Programs

by Alexandra Weinbaum and Anne M. Rogers

Prepared for

National Institute for Work and Learning
Academy for Educational Development

The Academy for Educational Development, founded in 1961, is an independent, nonprofit service organization committed to addressing human development needs in the United States and throughout the world. Under contracts and grants, the Academy operates programs in collaboration with policy leaders; nongovernmental and community-based organizations; governmental agencies; international multilateral and bilateral funders; and schools, colleges, and universities. In partnership with its clients, the Academy seeks to meet today's social, economic, and environmental challenges through education and human resource development; to apply state-of-the art education, training, research, technology, management, behavioral analysis, and social marketing techniques to solve problems; and to improve knowledge and skills throughout the world as the most effective means for stimulating growth, reducing poverty, and promoting democratic and humanitarian ideals.

The National Institute for Work and Learning, an institute of the Academy since 1988, seeks to bring the work, education, government, and community sectors together around the shared goal of working collaboratively to improve education–work relationships in the interests of individuals and society. Three areas of concentration define the Institute's activities: successful youth transition; work life education and adult literacy; and productive aging. The Institute accomplishes its mission in each of these areas through research, program documentation and evaluation, policy analysis, technical assistance and training, and information networking.

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Foreword

As we approach the twenty-first century, a large segment of our nation's young people are having a harder and harder time moving from school to work with any reasonable prospect for long-term productive employment. The lack of a comprehensive and effective school-to-work transition system not only frustrates many students but also has substantial costs to business and to our economy as a whole. A skill-deficient work force hampers our nation's economic growth, productivity, and ability to compete in an international economy. New modes of information and technology have forced a restructuring of the home, the school, and the workplace. As a result, there is a critical need to create systems that effectively serve the interests and potential of young people who are not planning to enter college directly after high school. These students need to leave school with the diverse skills, knowledge, abilities, and attitudes necessary for a rapidly changing world of work; community, social, family, and adult responsibilities; and lifelong learning.

The School-to-Work Opportunities Act of 1994 offers a chance to bring together partnerships of employers, educators, and others to build an effective school-to-work system that prepares young people for either high-quality jobs or further education and training. The new systems must include the following basic program elements:

- work-based learning that provides a planned program of job training or experiences, paid work experience, workplace mentoring, and instruction in general workplace competencies
- school-based learning that provides career exploration and counseling, instruction in a career major, and a program of study that is based on high academic and occupational skill standards
- connecting activities that bring schools, students, and employers together to connect the worlds of school and work by matching students with work-based learning opportunities and by training teachers, mentors, and counselors

The challenge is to build and implement a new system that moves beyond business as usual for students who are not on the college path. Their transition process from school to work must become the coordinated responsibility of school, family, business, community, and government. No single institution can or should take sole responsibility for or be expected to provide all of the approaches to educating, training, guiding, preparing, and supporting our young people.

The Academy for Educational Development's National Institute for Work and Learning has undertaken a Study of School-to-Work Transition Education Reform supported by the U.S. Department of Education, Office of Educational Research and Improvement. The study focuses on the planning and design, implementation, and impact of school-to-work transition reform initiatives. By documenting the design and integrity of exemplary programs and by assessing program experiences and impacts, the study offers critical lessons for those interested in adapting or adopting programs that effectively link schools with the business community to improve the transition from school to work. As part of the study, a series of papers have been commissioned to identify critical issues facing practitioners and policy makers as they begin to design and implement new school-to-work transition systems.

The overall study has been guided by a National Advisory Panel, which has provided direction and advice on the issues to be explored and topics to be considered. The National Advisory Panel comprises the following individuals:

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This paper accomplishes the following:

- describes the concept of contextual learning, its basis in contemporary research and practice, and its application in an array of school-to-work and service-learning programs
- provides a history of the concept of contextual learning, from the writings and practice of John Dewey through the recent research and practice in cognitive science
- provides examples of contextual learning in school-based vocational programs, in the workplace, in the community, and as cognitive apprenticeship
- explores a set of critical issues in contextual learning
- offers essential elements—curriculum and instruction; linkages with community organizations, including the workplace; staff development; school organization; and communication—for effective implementation of contextual learning
- offers important information and critical lessons for educators, employers, and policy makers as they consider the wide array of issues and challenges inherent in our evolving school-to-work system

Ivan Charner
Vice President and Director
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Introduction

Learning-in-context is so obvious a notion that the lay person might tend to dismiss its importance. Anyone who has ever endured the first day in a new job, played a pickup game of basketball, maneuvered with an arm in a cast, or repaired a car engine has experienced learning-in-context: that fruitful, if often frustrating, confrontation between a human mind's knowledge and skills and a new set of cognitive, social, physical, or mechanical demands.

Yet, "education," as distinguished from "learning," is usually identified by the lay person and educator alike with the traditional classroom environment of lectures and books, rather than with real-life contexts like the workplace or the community or the basketball court. The classroom model has dominated education in the United States. Even most occupational training, including corporate training, occurs in classroom settings.

However, many contemporary voices are calling into question the assumption that the classroom is the best place for education to occur. The first impetus for situating education in real-life contexts is the movement to provide workplace experiences for high school students. Many employers dissatisfied with their young employees advocate workplace experiences for students—internships, mentorships, apprenticeships—believing that these experiences might teach the job skills and/or work attitudes that will produce better employees. Critics of current vocational programs in the schools, similarly concerned about the gulf between many of these programs and the actual human resource needs of the United States economy, argue that workplace experiences are an essential element of effective vocational preparation.

Within the federal government, a major theme of current education policy is the goal of building bridges between education and employment. The Clinton Administration's School-to-Work Opportunities Act of 1994 proposes three strategies: school-based learning, work-based learning, and activities to connect school and workplace. The act defines work-based learning, in Section 102, as follows:

- a planned program of job training and experiences, including skills to be mastered at progressively higher levels, that are relevant to a student's career major and lead to the award of a skill certificate
- paid work experience
- workplace mentoring
- instruction in general workplace competencies
- broad instruction in a variety of elements of an industry

Under the previous administration, the 1990 Amendments to the Carl Perkins Vocational Education Act mandated the "integration of academic and vocational" instruction and provided federal funds to support such efforts and, in doing so, recognized the value of applied academics. The Secretary's Commission on Achieving Necessary Skills (SCANS) reports (U.S. Department of Labor 1991 and 1992) also promote contextualized education by arguing that generic skills are needed to succeed in the workplace and that schools therefore need to teach generic skills. The examples that they offer are also contextualized.

The workplace, however, is only one context. In our national haste to integrate workplace and schooling, it is important that we not lose sight of a broader vision of learning, defined by John Dewey as follows:

> . . . to make each one of our schools an embryonic community life, active with types of occupations that reflect the life of the larger society and permeated throughout with the spirit of art, history, and science. When the school introduces and trains each child of society into membership within such a little community, saturating him with the spirit of service and providing him with the instruments of effective self-direction, we shall have the deepest and best guaranty of a larger society which is worthy, lovely, and harmonious (John Dewey 1899, *The School and Society*, excerpt reprinted in McDermott 1981, p. 467).

Many would agree that our national need for well-informed, participating citizens is as great as our need for good workers.

Indeed, a second major impetus for moving education out of the schools is the youth community service movement. Its advocates see community service not simply as an opportunity for young people to perform good deeds, but as a vehicle for complex learning experiences about occupations, community, teamwork, and much more.

A third voice in this movement is that of cognitive science. A decade of cognitive research across the social sciences provides considerable information about how people learn and the characteristics of their learning. One clear finding is that the typical classroom setting—dominated by lectures, books, and passive learners—is a remarkably poor environment for learning for many students. Real contexts, whether workplaces or service settings or other environments, provide an array of stimuli and supports for learning that classrooms do not.

So although this paper emphasizes education that occurs in workplace contexts, we support and advocate a broader definition of "contextual learning." Training for the workplace and secondary schooling accounts for only a brief time in our lives. The concept of contextual learning applies to learning throughout our lifetimes and across the settings in which we find it necessary to learn.

This paper should be of interest to anyone affected by the School-to-Work Opportunities Act, to policy makers, and to practitioners involved with school-to-work initiatives. The paper is organized into four sections: an examination of the concept of contextual learning, its history, and current interest; a selective review of contemporary research-based theory and practice; an analysis of issues, particularly in applying contextual learning to the workplace; and a summary of best practices.

The Concept of Contextual Learning

Adopting the term "contextual learning" to label the subject of this paper is a somewhat arbitrary decision. People have used such terms as experiential learning, real-world education, active learning, learner-centered instruction, to mean similar ideas. Other terms, such as "service learning" or "work-based learning," define a more limited area of education, but share similar pedagogical assumptions and theory. We use the term "contextual learning" in this paper because of its breadth and flexibility.

The practice of contextual learning is as old as human learning, but its application to classrooms in the United States was first proposed by John Dewey, the progressive educator and philosopher. His laboratory school at the University of Chicago, established in 1896, embodied many of the principles of contextual learning, most fundamentally "the idea that there is an intimate and necessary relation between the processes of actual experience and education" (Dewey 1963, p. 20). Reacting against the rigid, rote curriculum of his day, Dewey advocated a curriculum and a pedagogy tied to the child's experiences and interests, and deplored the separation of education into mind and body and of school programs into academic and manual tracks.

In the intervening years, Dewey's ideas certainly have not vanished, but they receive lip service more often than actual implementation in schools and classrooms. As noted earlier, current interest in contextual learning derives in large part from pressure to bring the workplace and schooling, especially within high school vocational programs, closer together, on the grounds that both schooling and the economy would be strengthened. Sue Berryman and Thomas Bailey (1992) argue in their recent book, *The Double Helix of Education and the Economy*, that education and the changing economic conditions of the world are inextricably intertwined. They assert that as industry in the United States shifts from mass production to more flexible production modes, workers will need to change as well, becoming able to function in a decentralized setting with high degrees of employee involvement, change, and uncertainty.

Whether one shares their analysis of the economy's future direction or not, there is widespread agreement that our schools are failing to prepare students for employment in the primary job market, which is defined as those jobs that provide a living wage, benefits, and possibilities for advancement. The structure of high schools—divided into academic, vocational, and general tracks—is a structure rooted in turn-of-the-century decisions to provide to the sons and daughters of the immigrant, poor, and working classes educational experiences very different from those provided to the children of the more affluent. The vocational and general tracks, with some notable contemporary exceptions, fail to provide students with the academic skills or the relationship to workplaces needed to prepare them for jobs in the primary job market. Some vocational programs are isolated from the workplaces for which they are allegedly preparing students (Grubb, Kalman, Castellano, Brown, and Bradby 1991). Students are tracked into programs without understanding the insufficiency of the curriculum either to prepare for employment or further education (Oakes, Selvin, Karoly, and Guiton 1992).

Berryman and Bailey also discuss recent research in the cognitive sciences that challenges assumptions and practices typical of traditional education in both academic and vocational classrooms:

> At the heart of this research [is] the presumption that intelligence and expertise are built out of interaction with the environment, not in isolation from it. It thus challenge[s] our traditional distinctions between
>
> - head and hand
> - academic and vocational education
> - knowing and doing
> - abstract and applied
> - education and training
> - school-based and work-based learning (Berryman and Bailey 1992, pp. 5, 22).

The implications of this research for education are two-fold: first, school, as presently conceptualized, profoundly violates what we understand about how people learn and apply what they learn to new situations; second, these practices permeate all sectors of American education and training.

One of the more cogent summaries of the specific ways in which traditional education contrasts with "real-world" learning is offered in Lauren Resnick's 1987 Presidential Address to the American Educational Research Association. Drawing on contemporary research, her essay identifies major differences between school learning and learning that takes place in workplaces and other settings. Resnick has conceptualized the following contrasts between real-world learning and school learning:

Real-World Learning	School Learning
• socially shared	• individual
• thinking shaped by/ engaged with tools	• thought independent of tools
• learning engaged with objects and events	• learning dependent upon symbols
• situation-specific learning	• general and theoretical learning

Not surprisingly, Resnick finds that because of the reliance of technical, management, and professional education on traditional classroom methods, people are inadequately prepared for work situations. She recommends that schools offer more apprenticeship and simulated apprenticeship situations and concentrate on teaching people to be "adaptive learners," able to negotiate the inevitable transitions that occur in the workplace. Her own study of programs that purport to teach higher-order thinking found that the most effective among these programs incorporate such features of contextual learning as "socially shared mental work" and hands-on applications of more abstract learning. In other words, Resnick argues, schools should incorporate the features of out-of-school settings that promote the development of higher-order thinking skills.

Various strands of research contribute to the contextual learning synthesis. One important strand is the research on adult literacy. Cognitive psychologist Thomas Sticht has emphasized that because people bring what they already know to the learning process, adult literacy education should build on students' experiences and on familiar contexts. His approach, known as functional context literacy, is to find out exactly how specific jobs are performed and what constitutes expertise and to use the literacy and cognitive skills from these jobs as the basis for curriculum and teaching of reading, writing, and mathematics. This is a methodology that he successfully applied in developing the literacy skills of army recruits in the 1960s. Sticht and literacy researcher Larry Mikulecky found that recruits who were contextually educated improved their literacy skills and retained the skills longer than recruits who were taught in traditional classrooms (Sticht and Mikulecky 1984).

Mikulecky has studied differences between reading in workplaces and in classrooms. Most workplace reading is reading "to do" whereas classroom reading most often requires the mastery of specific content, usually for a test. To better prepare students for the workplace, Rand Drew and Mikulecky developed guidelines to help teachers investigate workplaces and conduct "literacy task analysis" (Drew and Mikulecky 1984). On the basis of these task analyses, they assist vocational teachers in incorporating workplace-related literacy skills into their classes.

Particularly relevant to the development of functional context literacy is the work of Irwin Kirsch of the Educational Testing Service (ETS) who has developed an adult literacy test used to assess how well adults perform on contextualized literacy tasks. Kirsch divides literacy tasks into prose, document (forms, schedules, handbooks, etc.), and quantitative literacy (any prose that describes quantitative information). The test has surveyed the skills of 6,000 people in Job Training Partnership Act programs and the Employment Services and Unemployment Insurance Centers. The test-results report reveals tremendous literacy deficiencies within the U.S. adult population (Kirsch 1992). Based on this research, ETS has been developing approaches to improving literacy, especially document and quantitative literacy since these aspects of literacy are most often neglected in our schools.

Cognitive psychologists have argued that schools fail to teach the thinking skills most required in high-performance workplaces, sometimes referred to in the literature as generic or metacognitive skills (Collins, Brown, and Newman 1989). These psychologists argue that these skills should be the basis of the curriculum and can be transferred from one domain to another if certain conditions are present, primarily a person's ability to recognize the similarity of situations. One approach to teaching thinking skills, discussed below, is the cognitive apprenticeship, modeled on the traditional craft apprenticeship.

In their work with cooperative learning programs in Canada, Simon, Dippo, and Schenke (1991) have made a critical contribution to current thinking about contextual learning that bridges the work of cognitive psychologists and ethnographic researchers studying how people perform their jobs in a variety of workplaces. In developing cooperative work placements and follow-up classroom work, they have introduced the concept of "working knowledge," which reaches beyond the technical aspects of work to incorporate the social aspects of work. They argue that, traditionally, workplace preparation has focused on the technical aspects of work and has tried to match students' aptitudes and skills with particular kinds of work. They advocate instead for work preparation that allows students to experience, reflect on, and analyze all aspects of workplaces. Such experiences promote understanding of how work is structured, for example, clerical work in a small business versus a large multinational corporation, and promote a holistic understanding of various kinds of workplaces.

Last, results of studies of learning styles have revealed that individuals vary in their preferred modes of learning, or learning style. Gender and cultural background may also be significant in this regard. Whether a student is an auditory, visual, or kinesthetic learner shapes how he or she most effectively learns any material, from reading to math to mechanics. All learners benefit when the educational environment enables them to learn according to their preferred style.

Contextual Learning—From Theory to Practice

Across the country, schools, classes, and multischool systems are adopting the principles of contextual learning. The result is an array of practices that are not always easy to label as one thing or another. Some of these practices imply major changes in school organization; others do not. A radical school restructuring is obviously involved when a school reorganizes its curriculum around occupational clusters and abolishes traditional academic departments. A much less sweeping change occurs when an academic teacher visits a vocational classroom to incorporate material into the curriculum.

The cases selected below are neither exhaustive nor unique. Rather, they illustrate ways that the philosophy and principles of contextual learning are reshaping education in the United States. The discussion of work-based education efforts is divided into four sections: school-based vocational education, workplace-based education, community-based education, and classroom-based cognitive apprenticeship approaches.

Contextual Learning in School-Based Vocational Education

Curricular and pedagogical reforms of school-based vocational programs, in part encouraged and funded by the Perkins Act Amendments, have produced a variety of approaches, some of which integrate contextual learning practices and beliefs.

The Fusion Project, initiated by the Phoenix Union High School District in Arizona with Carl Perkins funds, is using vocational study as the context through which to deliver academic subject matter (Rogers and Hubbard, in press). The district has provided release time to academic teachers to work with vocational teachers toward that end. Fusion Project funds have also paid for mathematics and English teachers to offer vocational teachers and instructional aides after-school workshops that demonstrate ways to integrate math and writing into their courses. Vocational teachers may also ask a Fusion Project teacher to use their lesson plans to demonstrate writing or math integration to their students. Typical sessions might include an exercise on separating judgment from observation or a session demonstrating how to write a process paper about changing the oil in a car.

Another approach to integrating academic and vocational context is the academy model. Initiated in a Philadelphia experiment in 1969, the model has since moved to other states and has been taken up with particular enthusiasm by California, where it receives state funding. The academy is a school-within-a-school that focuses on careers within a broad occupational area, like health or communications. Academic

and vocational instructors teach within the academy, often staying with the same groups of students for two or more years.

In California, the Oakland Health and Bioscience Academy, founded in 1985, serves approximately 175 of Oakland Technical High School's 1,650 students, from tenth through twelfth grades (Cutler 1992). Students of all abilities are admitted to the academy, although the emphasis is on students with a history of poor achievement; the main requirement is an interest in a health career. The academy immerses students in health careers—through observation, skills training, and performing tasks themselves—and uses health education as the context for their academic studies. The academy's goal is to graduate students better prepared either to work or to continue their education. The eight teachers who staff the academy remain with students for the entire three-year program. Team teaching characterizes the program in which class size averages between twenty-six and thirty-one students. Experts train students in first aid, CPR, and laboratory techniques. Besides classroom study that emphasizes biological sciences, they receive tutoring from university students and have assigned mentors. Students gain work-based experience through internships at local hospitals. Students attribute their success and motivation to smaller classes, to teachers who care, and to real-world experiences.

In Massachusetts, the Rindge School of Technical Arts (RSTA) is one of seven "houses" that make up the campus of Cambridge Rindge and Latin School (Foster 1992 and Center for Law and Education Vocational Education Project 1993). RSTA serves 280 of the high school's 2,400 students, from ninth through twelfth grade, integrating vocational and academic education, broadening vocational education away from narrow training, and creating links between vocational education and local economic development. Communication skills—both verbal and written—are emphasized throughout the program. Ninth graders, instead of taking a traditional vocational class such as sheet metal or culinary arts, take the class, CityWorks, followed by science, social science, math, and English. CityWorks offers five modules that teach an overview of various trades, as well as instruction in communication and transferable academic skills. To understand the local economy, teams of students are assigned to conduct detailed inventories of a neighboring block (using tape recorders, cameras, measuring instruments) and to create displays on their findings and communicate these to the class. Students later undertake three-week "exploratories" in areas such as culinary and graphic arts and make presentations on these exploratories. Students complete the unit by creating a résumé and a portfolio with samples of their work.

In their sophomore year, students participate in the pilot program, "Industries," in which they examine the transportation industry in terms of the community's needs. As juniors and seniors, students choose between "school-based enterprises" or "work-

based learning." The former brings enterprises into the school; the latter places students in community enterprises.

As Grubb, Davis, Lum, Plihal, and Morgaine (1991) recognize, the most ambitious efforts to integrate vocational and academic education ultimately reconstruct the high school by replacing the shopping-mall curriculum with coherent course sequences, encouraging collaboration rather than isolation among teachers, reducing tracking, enhancing student engagement, enlisting business participation, and improving teaching by replacing the decontextualized methods of most academic classrooms with the contextualized methods of the best vocational courses. So conceived, it is understandable why the reform underway in school-to-work transition programs is eliciting so much interest across the educational spectrum.

Contextual Learning in the Workplace

Most work-based educational programs are associated with school-to-work transition or vocational programs. Usually, they are part of a broader reform of curriculum and pedagogy. The Kalamazoo Valley Consortium Education for Employment (EFE) Program, for example, serves nine public school districts and about 1.7 million students throughout Kalamazoo County, Michigan (Rogers and Hubbard, in press). The consortium has attracted national attention for its work site-based occupational programs. Three EFE programs operate entirely outside of the schools in collaboration with business partners who provide the facilities in which all class meetings are held: the Health Occupations Program is housed in Bronson Hospital; the Hospitality Program, in the Radisson Hotel; and the Law Enforcement Program, in a juvenile detention facility.

This physical location of the EFE programs, however, is only one measure of the consortium's commitment to contextualizing education. All three programs use the study of a career as the medium through which academic study, professional training, and work experience are combined and integrated. All offer work experience in the second year and articulation credit at the community college. They emphasize teamwork, safety, ethics, and service excellence. The programs are run by instructors who have extensive background in the industry, who are supported by the EFE's administrators and counselors, and who are guided by business partners.

In Massachusetts, RSTA also embarked on new university faculty, business, and community partnerships that have resulted in workplace experiences for students. Eleventh- and twelfth-grade students work with Polaroid employees in areas such as instrumentation, electronics, and plumbing for two-and-one-half-hour shifts for which they earn wages. Students also write weekly summaries of their work and make

presentations to Polaroid staff. To prepare for teaching careers, students may enter an internship program with Lesley College, spending three mornings a week at the college, two mornings in elementary schools, and the rest of the day at RSTA taking classes.

Contextual Learning in the Community

An early model for taking education into the community was Foxfire, a curriculum model that blossomed from one teacher's idea into a movement in the early 1970s. High school teacher Eliot Wigginton engaged his students in collecting the traditions and culture of Rabun County, Georgia, an Appalachian community. Poor and working class rural students to whom school had meant little were suddenly motivated by the experience of interviewing their families and neighbors and by the goal of publishing what they learned in the *Foxfire* magazine. Wigginton has defined his approach as "Students and teachers collaborate on important and intriguing issues using certain experiential methods to address and assess them" (Knapp 1993). By urging teachers to begin with what interests their students, no matter what the objectives of the curriculum are, Wigginton reiterates John Dewey's belief that learning begins with student interest.

A different model for taking education into the community is youth community service. This movement has gained many advocates in the past decade, in part in hopes of responding to the alienation many young people feel toward a society that no longer offers them meaningful roles. Community service offers a sense of accomplishment, a chance to work with others, and opportunities to explore the world of work. Less often emphasized by proponents is the powerful connection between community service and the principles of contextual learning. Advocating community service for young adolescents, Joan Schine writes the following:

> It [community service] challenges the volunteer to work collegially with others, to learn to compromise and to communicate successfully. It encourages the acquisition and exercise of new skills. It presents "real world" opportunities to confront problems, consider alternatives, and find solutions (Schine 1990, p. 6).

Or to return to Resnick's four characteristics, community service at its best is socially shared, engages directly with objects and events, engages with physical or cognitive tools, and immerses young people in real and specific situations.

Schine emphasizes that for learning to result from community service, programs must offer opportunities for thoughtful reflection on the meaning of the work students are doing. She offers as an exemplar the well-regarded program at Shoreham-Wading River Middle School in New York. Shoreham integrates community service into the

curriculum, provides administrative support, and includes ample classroom time for preparation and reflection. Any teacher may choose to integrate service into the courses he or she teaches. A full-time coordinator and three part-time specialists handle the myriad administrative details, including placements, liaison with sites, and transportation. Shoreham maintains a two-to-one ratio of class time (devoted to preparation and debriefing) to on-site work.

Contextual Learning as "Cognitive Apprenticeship"

In the *American Educator*, Collins, Brown, and Holum (1991) elaborated upon a model of instruction, first proposed by Collins, Brown and Newman in 1989, which incorporates elements of schooling into an apprenticeship structure that draws on the apprenticeship way of learning, but also incorporates elements of schooling. The primary purpose of the model is "to make thinking visible" to model cognitive skills.

Thinking is a process as well as a skill. Collins et al. point to research that showed that students usually passively acquire knowledge but do not know how to apply it. Turning to the traditional apprenticeship, which teaches physical processes and skills, Collins et al. identify four aspects of the apprenticeship that occur as the expert gradually turns over more responsibility to the apprentice:

modeling: the expert demonstrates how to do a task while the apprentice watches

scaffolding: the expert provides varying levels of support as the apprentice attempts the tasks

fading: the expert gradually removes support, giving the apprentice increasing responsibility

coaching: throughout the apprenticeship, the expert oversees and guides the apprentice in a variety of ways—suggesting, evaluating, challenging, encouraging, etc.

The authors emphasize two aspects of the cognitive apprenticeship: observation and social context. Observation not only exposes students to the steps in individual tasks, but provides them a "conceptual model" of the whole, the big picture toward which they are striving. Second, apprenticeship usually occurs in a rich social context with multiple experts and learners, helping students see that experts have different approaches to tasks and that students may be in many different learning stages.

Collins et al. (1991) describe three models of teaching in reading, writing, and mathematics, which they believe embody the cognitive apprenticeship model. For example, Palincsar and Brown's (1984) "reciprocal teaching" models for students the skills of composing questions based on text, summarizing text, predicting what will occur next, and clarifying text. Teacher and students read a paragraph silently together, with the teacher first modeling the four skills and then allowing the students to take on as much as they are able to. The authors point to evidence of reciprocal teaching's effectiveness, especially with poor readers. They go on to note that traditional apprenticeship differs in three important ways from cognitive apprenticeship, differences for which teachers must compensate:

- Because traditional apprenticeship teaches observable skills, teachers must try to make the process of thinking visible.
- Because traditional apprenticeship occurs in a workplace whose products are tangible and, therefore, motivating, teachers must situate abstract classroom tasks in contexts that seem authentic and motivate students.
- Because traditional apprenticeship teaches skills inherent in the apprenticed craft, teachers must demonstrate the transfer of cognitive skills across a range of tasks.

Berryman and Bailey (1992, pp. 86–88, 109–12) call for an across-the-board organizing of learning "around the practices reflected in cognitive apprenticeship." Because, they argue, cognitive apprenticeship "works with, rather than against, the natural learning system of human beings," it is a more effective way for all students to learn. Moreover, they note that the emphasis on "symbolically based" activities such as reading, mathematics, and writing by a cognitive apprenticeship render it a more suitable method for preparing students for the contemporary American workplace than traditional apprenticeship. Formerly mechanical occupations, for example, now rely on microprocessors and other components whose functioning is not observable and requires workers "to be able to represent their structures and processes symbolically in their heads."

Berryman and Bailey identify several high school projects created by high school teachers that they feel exemplify the cognitive apprenticeship. One example is a nine-month project at Conval High School in Peterborough, New Hampshire, which engaged students in building a solar-powered car and culminated with the school's team competing in a five-day race. To build their car, students had to learn and use many skills, ranging from physics to drafting to welding to solar engineering. They built, tested, and evaluated several models before settling on a final design. They also acquired the language and graphics skills needed for a public relations effort and the

interpersonal and leadership skills necessary to maintain the teamwork. Throughout, they were motivated by the desire to compete and the responsibility to the team.

Issues in Contextual Learning

The commonsense aspects of contextual learning leave the idea at risk of careless implementation. Simply placing a student in a "real-world" context does not guarantee a learning experience, as many former interns and supervisors of internships can attest. As the discussions above indicate, effective contextual learning results from a complex interaction of teaching methods, content, situation, and timing.

One major issue, therefore, in contextual learning is simply getting people past the optimistic assumption that a real-world context is inherently educational. Not only are such experiences likely to fail the students involved, but they discourage teachers and administrators from further attempts. Much more than student placement is required.

A second obstacle—and one that characterizes the implementation of all school innovations—is finding time to plan and carry out an effective contextual learning environment. The project cited by Berryman and Bailey, for example, of building a solar-powered car required major reorganization of the traditional school schedule as well as collaboration among vocational and academic teachers in planning and carrying out the project. Such projects require a rethinking of traditional school schedules, as well as providing opportunities for teachers to learn new material, design curricula, plan with their colleagues, and reflect on the effectiveness of their practice.

Contextual learning requires instructors to think in nontraditional ways. Teachers committed to teaching a particular content area must now think about how to teach that content through a meaningful context. They must also learn how to collaborate with others in developing curriculum.

For even the most willing and interested teacher, such far-reaching pedagogical changes are demanding and time-consuming. Integrating a contextual learning strategy requires instructors to undergo fundamental professional change through staff development.

Another kind of issue is knowing whom contextual learning is for. All learners benefit from contextual learning. Although some students have great difficulty learning in any other way, contextual learning applies to all students because it reflects the basic structure of human learning. Although contextual learning has been most often

discussed in relationship to vocational or occupational programs, it should apply to academic coursework as well.

Consideration of contextual learning in academic skill areas has produced the cognitive apprenticeship model. One issue raised by the model is the element Collins et al. referred to as "sociology." In practice, cognitive apprenticeship relies considerably on simulation or modeling rather than on real-life situations. The value of the real-life situation, both as motivator and as learning environment, has been a primary element of contextual learning. Further research is needed to understand the impact of attempting to create contextual learning primarily within a classroom context rather than a real-world context. Can tasks truly be simulated in a classroom, and what is lost or gained by not using real-world contexts for learning?

Programs that attempt to implement contextual learning within a workplace setting encounter a specific set of issues. One issue is whether or not the workplace experience is structured to promote learning. A student who is assigned only routine tasks in a work setting (serving coffee, sweeping the floor, filling out forms) may learn very little. Such a placement is analogous to the student in a classroom performing rote tasks. The student may memorize the performance of the task, but the learning is limited in interest and in transferability to other situations. In *Learning Work: A Critical Pedagogy of Work Education*, Simon et al. (1991) argue that students should learn "working knowledge" through cooperative or apprenticeship type programs. This includes both technical and social knowledge, for example, the technical terms used in the workplace, as well as the informal ways in which knowledge is communicated about "how to get the job done." In short, students need to learn not only the job, but also the systems and the sociology of the workplaces into which they are placed.

A related issue is the necessity that employers who agree to host students in their workplace be trained. The employer's primary purpose is to conduct a business efficiently. The educator's goal is to provide an optimum learning environment for students. Although those purposes may overlap, they often will not. Employers may need help to understand the broader goals of education. Educators may need help to understand the production demands and constraints under which businesses operate. Ongoing coordination between instructor and employer will be needed to ensure that the situation promotes learning without unduly burdening the business.

Best Practices for Contextual Learning

Several aspects of school and workplace practice are essential to the effective implementation of contextual learning. Jobs for the Future has identified ten elements conducive to effective work-based learning:

Element 1: Partners formally agree on the goals of the work-based program and how to achieve them.

Element 2: Student learning at the workplace progresses according to a structured plan.

Element 3: Work-based experiences promote the development of broad, transferable skills.

Element 4: School-based activities help students distill and deepen lessons of work experience.

Element 5: Student learning at the work site is documented and assessed.

Element 6: The program prepares students to enter the workplace.

Element 7: Students receive ongoing support and counseling.

Element 8: The program provides orientation, training, and ongoing support to work site and school staff.

Element 9: Administrative structures are established to coordinate and manage the work site component.

Element 10: Mechanisms exist to assure the quality of students' work-based learning experiences (Goldberger, Kazis, and O'Flanagan 1994).

School practices can be summarized under the headings of curriculum, instruction, and assessment; linkages with workplaces and other contexts; staff development; school organization; communication; and time. Prior to any of these aspects is an agreed-upon vision among school, community, and workplace partners about the goals of a contextual learning program, whom it serves, and what strategies it uses to achieve its goals.

Curriculum, Instruction, and Assessment

Contextual learning requires a rethinking of three areas: curriculum, instruction, and assessment. Traditional disciplines must be adapted to teach material in meaningful contexts; artificial distinctions between vocational and academic studies should be eliminated; new teaching strategies should be created once the teacher is no longer the dispenser of wisdom and the textbook is not the basis for lesson plans; and new assessments must be developed to inform instruction and to help students, teachers, and parents better understand how students learn once rote learning and textbook mastery are abandoned.

Linkages to Workplaces, Community Organizations, and Other Contexts

Students need hands-on experiences in which they learn about and participate in workplaces. These experiences may involve extended periods in paid work but may also be unpaid internships in community organizations, or they may involve other contexts such as museums that provide learning opportunities outside the classroom. These experiences must be carefully structured through in-class preparation; coordination with supervisors in workplaces or other settings; and careful sequencing of learning experiences in which increasing levels of complexity are introduced and students have opportunities to experience many aspects of workplaces. To accomplish this, workplace or community experiences must be documented, assessed, and linked to classroom instruction through opportunities for reflection.

Staff Development for Teachers and Employers

Staff development for teachers and for employers working with schools is critical before implementing a contextual learning program on an ongoing basis. It should provide teachers with opportunities to learn about the nature of the workplaces for which students are being prepared. Employers need to understand how to structure employment in ways that provide a range of learning experiences and responsibilities. They also need opportunities to communicate with teachers and to contribute to the development of curricula. In addition, plans for assessing workplace or community experiences must be developed.

School Organization

Currently, school organization in high schools supports a traditional shopping-mall curriculum, most often divided into forty-five minute periods. Teachers usually teach

within their disciplines, behind closed doors in isolated classrooms. Contextual learning requires a complete reorganization of the schedule; rethinking of curriculum and instruction; and opportunities for teachers to plan programs, observe work settings, learn in workplaces, and collaborate with employers and businesses and other organizations where students will be placed for internships or paid work. Administrative support must be provided to teachers to carry out the difficult tasks of rethinking curriculum and instruction, as well as planning and collaborating.

Communication

Successful contextual learning requires ongoing communication among all relevant players—teachers, employers, or other out-of-school supervisors or mentors, as well as among students and parents. Parents should be invited into classrooms to learn about and experience new forms of teaching, to become informed about program goals and outcomes and their child's progress, and to be encouraged to provide input into program planning and development. Similarly, student feedback on the effectiveness of programs is an essential component of program assessment and refinement.

Time

All innovations require time—time to plan, to collaborate, to learn new approaches, and to reflect on what is accomplished. They also require time to develop effective implementation strategies. School change theorists argue that successful school change may require three to five years. Without allowing for this learning curve among practitioners, contextual learning will be implemented in ways that adapt to and reinforce current practice rather than change it.

Conclusion

Differing views on the ultimate purposes of education will determine how contextual learning is implemented in schools and workplaces. For some schools, the main purpose will be to prepare an informed and active citizenry; for others, preparation for work and further education may be the main goals. As schools experiment with contextual learning, they will create (and already have created) a rich array of programs that differ in major respects. Many of the most interesting experiments, such as the ones cited in this report, are occurring in vocational schools—not a traditional site for educational research. Researchers must overcome this bias, as they are beginning to do, to study the potential of these educational experiments to change education for everyone.

In a pioneering article, "Beyond Tinkering: Reconstructing Vocational Education," Jeannie Oakes foresaw that vocational education—not as it presently exists, which often results in tracking by race, gender, and class, but as it could exist—has the potential to radically recast American schools. Contextual learning has the potential to end the vocational/academic and the hand/mind split that Dewey deplored and whose negative effects he anticipated. The function of schools must, from our perspective, be larger than preparation for either the workplace or higher education. Current concern for school-to-work transition leading to incorporation of contextual learning practices should not obscure the larger goals of education so eloquently defined by Dewey and elaborated upon by contemporary educators who still derive philosophical and pedagogical inspiration from his work.

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